

**For Discussion on
28 May 2012**

**LEGISLATIVE COUNCIL
PANEL ON ENVIRONMENTAL AFFAIRS**

Trial of Electric Buses by Franchised Bus Companies

PURPOSE

This paper seeks Members' support on the proposal for funding the five franchised bus companies to purchase a total of 36 electric buses and related charging facilities for trial in Hong Kong.

BACKGROUND

2. At present, there are some 5,800 franchised buses in Hong Kong and they are one of the major sources of roadside air pollution on busy corridors. To improve roadside air quality, we need to reduce emissions from franchised buses.

3. The ultimate policy objective of the Government is to have zero emission buses running across the territory. Electric buses, which do not have any tailpipe emissions, are a prime candidate to help franchised bus companies fulfill this policy objective.

4. The electric buses now available on the market are single-deckers. They are used as public buses in Mainland and overseas cities such as Shanghai, Shenzhen, Beijing and Seoul. Two main types of electric buses are being used in public transport, namely, supercapacitor buses which use supercapacitors as the energy storage devices, and battery-electric buses which are purely operated by batteries. A fully-charged battery-electric bus can travel a distance of about 200 kilometres while a full charging will normally last for three to four hours. It is also feasible to top up the battery level through charging about one to two hours during non-peak hours. On the other hand, supercapacitor buses can sustain a travelling

distance of about seven to ten kilometres and can be fully charged in a few minutes. They are more suitable for routes of short-distance, but charging facilities will need to be provided at bus stops and/or termini for top-up charging. A photo on a supercapacitor bus and its charging station is at Annex.

5. In the 2011-12 Policy Address, the Chief Executive proposed to earmark \$180 million for franchised bus companies to purchase 36 electric buses for trial runs on a number of routes to assess their performance in different conditions.

ENVIRONMENTAL BENEFITS

6. Electric buses do not have exhaust emissions. Replacing conventional franchised buses with electric buses can improve substantially roadside air quality, particularly along busy corridors. Besides it has been a world-wide trend to try out electric buses in public transport as a green initiative.

7. Unlike the public buses in other cities, the operational mode of franchised buses in Hong Kong is much more intensive, characterised by high operation frequency, long service hours, high peak capacity requirement, hilly terrains, as well as hot and humid summer that requires intense air-conditioning capability. These stringent operational conditions will put electric buses, particularly their batteries and supercapacitors, to very severe test. Hence, a trial run for electric buses is essential for Hong Kong before wider application is considered.

PROPOSAL

8. We propose to fully subsidise the five franchised bus companies (namely The Kowloon Motor Bus Company (1933) Limited (“KMB”), Citybus Limited (“Citybus”), New World First Bus Services Limited (“NWFB”), Long Win Bus Company Limited (“LW”), and New Lantao Bus Company (1973) Limited (“NLB”)) to purchase a total of 36 single-deck electric buses (including 28 battery-electric buses and eight supercapacitor

buses) and related charging facilities (including installation cost) for trial runs on different routes.

9. The proposed trial aims to ascertain the readiness of electric buses to take up the role of conventional diesel buses in Hong Kong in terms of technical suitability, operational feasibility and financial affordability. Electric buses differ from conventional diesel buses in respect of operational characteristics, maintenance and training requirements, as well as capital and operational costs. The trial will help the franchised bus companies gather first-hand experience and knowledge for the possible wider application of electric buses in their bus fleets. The trial can also encourage electric bus manufacturers to provide suitable electric buses to meet the needs of the Hong Kong market.

10. Having consulted the five franchised bus companies and taking into account their fleet size, service areas and technology preference, we propose the following distribution for the 36 electric buses –

- (a) KMB – eight supercapacitor buses for testing on two routes, and ten battery-electric buses on five routes;
- (b) Citybus/NWFB – ten battery-electric buses for testing on five routes;
- (c) LW – four battery-electric buses for testing on two routes; and
- (d) NLB – four battery-electric buses for testing on two routes.

11. The operational arrangements of the trial scheme will model on those of the trial scheme for six hybrid buses that this Panel supported in January 2011. In order to provide a more comprehensive assessment on the new technology, we will require each franchised bus company to acquire electric buses from at least two bus suppliers whenever practicable.

12. The franchised bus companies will be required to operate the electric buses along routes covering different operating characteristics so as to fully assess their capabilities. The bus routes in trial will include highways and connections within urban areas and new towns (with frequent starts and stops), and those cover different road gradients, route lengths, and

passenger loadings as far as practicable.

13. The franchised bus companies will be responsible for the recurrent costs arising from operating these buses and the related charging facilities. Given that the Government will fund the full cost of procurement and that the number of electric buses involved is small compared with the overall fleet size of the franchised bus, we do not expect the trial to have any implication on the bus fares.

14. The trial will last for two years in order to fully assess the operational efficiency and performance of the electric buses under local conditions. A mid-term review will be carried out one year after the commencement of the trial to provide a preliminary assessment of the performance of the electric buses. The franchised bus companies will be required to continue to deploy the electric buses for providing franchised bus service until the end of the economical service life of the vehicles concerned. If the test results are satisfactory, the Government will encourage franchised bus companies to use electric buses on a much larger scale as far as practicable. In this regard, additional requirements have already been included in the three bus franchises¹ newly granted in April 2012 so that the bus companies concerned have to acquire the most environment-friendly buses that are technologically proven and commercially available when acquiring new buses in future, taking into account affordability of the companies and passengers. Similar requirements will be imposed on the three remaining bus franchises upon their expiry in 2016/17.

15. A task force, comprising representatives from the franchised bus companies and government departments, including the Transport Department (“TD”) and Environmental Protection Department (“EPD”), will be set up to monitor the trial.

FINANCIAL AND CIVIL SERVICE IMPLICATIONS

16. Based on the information provided by potential electric bus suppliers and the franchised bus companies, we estimate that the total cost

¹ The five franchised bus companies are operating six franchises.

for 36 single-deck electric buses (including 28 battery-electric buses and eight supercapacitor buses) and related charging facilities (including installation cost) is about \$180 million.

17. Subject to Members' support, we will seek the Finance Committee's approval for creating a one-off commitment of \$180 million for the proposed trial. Taking into account the time required for tendering and a delivery time of about 12 months, we envisage that the trial could commence in early 2014.

18. Additional staff resources have been allocated to EPD and TD to oversee the trial, monitor the setting up of the charging facilities, evaluate the environmental performance of the electric buses and the trial results, and work with the franchised bus companies and bus manufacturers to take forward the trial. The additional manpower resources will be reflected in the Estimates of the relevant years.

ADVICE SOUGHT

19. Members are invited to support the proposed trial of electric buses as set out in paragraphs 8 to 18.

Environmental Protection Department
May 2012

A supercapacitor bus being tested by KMB is charging at the Lai Chi Kok Depot

